

Accelerator Systems Division Highlights Ending June 10, 2005

Installation

Craft Snapshot 5/31/05

ASD productive craft workers	63.0
Foremen (Pd by 15% OH)	7.0
AMSI management (Pd directly)	3.0
TOTAL AMSI WORKERS	76.0
Less WBS 1.9, 1.2 etc	12.0
Less absent	4.0
TOTAL PD BY ASD/ORNL DB WPs	47.0

Accelerator Physics Operations

Ion Source

- A 1 micron depth filter and a 0.45 micron pleated filter have been installed in the ion source cooling water line on the Front-End. This further reduces the likelihood that a waterline creates an electrical short like the one on April 14, 2004, that caused 3 hours downtime.
- The efforts to match the external antenna with the RF matching network continue.
- The presentation for the DOE review was prepared.
- The Ion Source and LEBT upgrade proposed for the power upgrade has been written up and the costs have been estimated

Survey and Alignment

SCL:

Align dummy cryo section 23

Completed re-alignment of laser transfer line and boxes

Completed re-alignment of 9 cryo dummy sections

Aligned the high energy differential pumping station

Aligned pipe section upstream of HEDPS

HEBT:

Rough aligned 12Q45 QH10

Mapped the area between LINAC dump quads QH05 and QV06

Re-aligned HEBT quads QH20, QV21, QH22, QV27, QH28, QV29

Completed HEBT network observations (weekend work)

RING:

No activity

RTBT:

No activity

Magnet Measurement:

21Q40_58 fiducialized

Optically aligned 21Q40_46

21Q40_46 fiducialized

Optically aligned 21Q40_47

Mechanical

Magnets

- RTBT Quads QV03 through QV11 and QH18 are now installed.
- We have also measured two more 21Q40's.
- We assembled the 8Q35 on the HEDP stand.
- We are winding the coil on the HEBT DH13 measurement fixture.

Water Systems Installation

- Installation of the Ring Collimators' remote cooling connections continued.
- Installation of the RTBT 21Q40 magnets' cooling connections started.
- Modification of the RFTF Klystron cooling system to accommodate the new Thales 2.5 MW klystron continued.
- Preventative Maintenance on the Linac water systems continued.

Ring Systems Installation

- The HEBT collimator remote clamps are being adjusted for seal installation and leak testing
- The HEBT magnet assembly QH10 was aligned for vacuum interconnection.
- The HEBT beamline cross-over bridge was received and staged for assembly.
- The HEBT laser stripping facility infrastructure modifications were started.
- The HEBT shield wall blocks were staged for installation starting Monday.
- The RING vacuum turbo molecular pump station junction box locations were defined.
- The RTBT 21Q40 magnets QV03 and QH04 were installed.
- The RTBT remaining beam pipe support stands were received.
- The RTBT / Target Duratek shield block storage location discussions were initiated.

Electrical

- Upgrade of the SCR Controller fast over-current protections continues and is almost complete. Since installing this system, we have experienced zero SCR failures. Testing of the new fuses was performed last week, and they survived a 10 hour run with no fuses clearing. Installation of these fuses on the remaining systems will take place after some more operational data is acquired. The new SCR gate hard firing card has been installed on SCL-ME1 and DTL-ME1, and reliability in this area is expected to improve. Several studies were performed on SCL-Mod1 to investigate the droop, and the problem was isolated to a faulty voltage diagnostic.

HPRF

Ring RF

- Alignment team has marked the location of the amplifier rails for one of the cavities. We will mount the guide rails and mate one amplifier to its cavity. After we are convinced the rails are in an acceptable location we will go ahead and install the remaining rails and amplifiers.
- Electricians have been scheduled for next week to complete the tunnel wiring.

LLRF

Cryo Systems

- During the weekend of June 4th, the cleanliness of the warm sections between cryomodules was verified by sequentially opening the isolation gate valves while monitoring the radiation level at the field emission threshold of the neighboring cavity using 19 phototube/scintillator assemblies. This test was done for 39 of the 44 valves in the SCL: three valves were not available because were not connected yet and two valves could not be opened due to mechanical problems. No increase in radiation was observed in any of the cavities, clearly indicating that the warm sections were properly cleaned and assembled and that there is no dust contamination.
- The test was also used to verify the functionality of the valve opening and interlock system via EPICS.
- During the test, as many as 71 cavities were operated simultaneously.
- With the radiation detection system it was possible to measure the field emission threshold for all the cavities online. These data were used to set up all the cavities at those threshold field levels and comparing the calculated RF losses with the thermal load on the cryogenics system, measured by subtracting power from the heaters inside the cryomodules to compensate for the additional RF losses. The agreement was at the 15% level, normal for these types of measurements. Additional measurements of heat loads at higher field levels were not possible due to various instabilities in the cryogenics system.
- During the week very little testing was possible due to the work to bring the cryo system to 2.1 K.

Controls

- Larry Doolittle visited this week from Berkeley, and work was done to adapt the LLRF software to new firmware features that now handle the “phase push” of the modulator and transmitter.
- Rao Ganni visited this week from Jefferson Lab, and, in spite of numerous hardware problems, work was done to “tweak” the automated pump down sequence for the 2K Cold box.
- The Controls Group supported the “SCL vacuum valve opening” campaign last weekend. In general controls equipment performed as expected. There were a number of punch-list items identified that are now being worked. Checkout of “dummy cryomodule” vacuum controls began in earnest this week.
- A preliminary cost estimate, CDR write up (Basis of Estimate) and WBS Dictionary for controls for the Power Upgrade Project (PUP) were completed and submitted this week.
- The mercury pump was operated from the target control room for the first time on 6/9/05 after a series of interlocks were by-passed using the force mode with RSLogix 5000 PLC programming software. This is the first use of EPICS in the target control room to operate and control equipment to be used for target operations.

- Operational software for the SCL power supplies is almost complete. SCL_PS:IOC1 is already running in a test operational configuration and all eight SCL power supply IOCs will begin an operational test next week.
- Testing of the HEBT PPS started at the end of this week. Work continued on the TPPS software specifications and the HEBT Chipmunk integration test plan. Work also began on implementing five new chipmunks to be placed in the Linac tunnel to detect radiation from some newly developed fault scenarios.
- CPLD code for the fast valve controller (the second of two designs) was written and simulated this week. Testing is scheduled for next week.
- The HEBT water skid software was completed and tested this week.
- Preparations are being made for certification of the phase 2 PPS which includes the Linac and the HEBT. Installation of Beam Shutdown Stations is complete. Remaining tasks include completion of wiring terminations, installation of control panels in the CLO, completion of PLC programs, completion of EPICS databases and archiver and building the HEBT-Ring shield labyrinth and door. This is the last item that will have PPS equipment installed on it.
- PPS work in the Ring in progress includes finishing the remote I/O racks in the Ring Service Building and running conduit and pulling cable in the Ring Service Building.

Beam Diagnostics